

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION**

KATANA SILICON TECHNOLOGIES
LLC,

Plaintiff,

V.

WESTERN DIGITAL
TECHNOLOGIES, INC.,

Defendant.

Case No. 6:21-cv-374

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Katana Silicon Technologies LLC (“Katana”), by and through its attorneys, for its Complaint against Defendant Western Digital Technologies, Inc. (“WD”), and demanding trial by jury, hereby alleges, on information and belief with regard to the actions of WD and on knowledge with regard to its own actions, as follows:

I. NATURE OF THE ACTION

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 271, *et seq.*, to obtain damages resulting from Defendant's unauthorized use, sale, and offer to sell in the United States, of products, methods, processes, services and/or systems that infringed Plaintiff's United States patents, as described herein.

2. Defendant manufactured, provided, used, sold, offered for sale, imported, and/or distributed infringing products and services, and encouraged others to use its products and services in an infringing manner, as set forth herein.

3. Plaintiff seeks past damages and prejudgment and post-judgment interest for Defendant's infringement of the Asserted Patents, as defined below.

II. PARTIES

4. Plaintiff Katana Silicon Technologies LLC is a limited liability company organized and existing under the laws of the State of Texas, with its principal place of business located at 5204 Bluewater Drive, Frisco, Texas 75036.

5. Katana is the owner of the entire right, title, and interest in the Asserted Patents, as defined below, including the right to sue for and collect all damages and to seek and obtain any other relief for infringement.

6. On information and belief, Defendant Western Digital Technologies, Inc. is a Delaware corporation with regular and established places of business at 7501 N. Capital of Texas Highway, Suite A 100, Austin, TX 78759, and 9442 N. Capital of Texas Highway, Austin, TX 78759. Defendant may be served through its registered agent Corporation Service Company d/b/a CSC-Lawyers Incorporating Service Company, at 211 E. 7th Street, Suite 620, Austin, TX 78701.

III. JURISDICTION AND VENUE

7. This is an action for patent infringement which arises under the patent laws of the United States, in particular, 35 U.S.C. §§ 271, 281, 283, 284, and 285.

8. This Court has exclusive jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331, 1332, and 1338(a).

9. This Court has personal jurisdiction over Defendant in this action pursuant to due process and/or the Texas Long Arm Statute, by virtue of at least the substantial business the Defendant conducts in this forum.

10. Defendant has committed acts of infringement in this District directly and through third parties by, among other things, making, selling, advertising (including through websites), offering to sell, distributing, and/or importing products and/or services that infringed the Asserted Patents as defined below.

11. Defendant has, directly or through its distribution network, purposefully and voluntarily placed infringing products in the stream of commerce knowing and expecting them to be purchased and used by consumers in Texas.

12. Defendant has committed direct infringement in Texas.

13. Defendant has committed indirect infringement based on acts of direct infringement in Texas.

14. Defendant has transacted, and as of the time of filing of the Complaint, continues to transact business within this District.

15. Defendant derives substantial revenues from its infringing acts in this District, including from their manufacture and sale of infringing products in the United States.

16. On information and belief, Defendant has at least two regular and established places of business in this District, including 7501 N. Capital of Texas Highway, Austin, TX 78759 and 9442 N. Capital of Texas Highway, Austin, TX 78759.

17. On information and belief, a WD technical sales support team that supports a large local customer with hard drives and infringing solid-state drives is located at 9442 N. Capital of Texas Highway, Austin, TX 78759.

18. Venue is proper against Defendant in this District pursuant to 28 U.S.C. § 1400(b) because it has committed acts of infringement in this District. Defendant's presence in this District is substantial, including at least at the places of business noted above, as well as through its partnership with Caringo, Inc., headquartered at 6801 N. Capital of Texas Highway, Building 2, Suite 200, Austin, Texas 78731.

19. Additionally, Defendant—directly or through intermediaries (including distributors, retailers, and others), subsidiaries, alter egos, and/or agents—ships, distributes, offers for sale, and/or sells their products in the United States and this District. Defendant has purposefully and voluntarily placed one or more of its products into the stream of commerce that infringe the Asserted Patents with the awareness and/or intent that the products would be purchased by consumers and businesses in this District. Defendant has knowingly and purposefully shipped infringing products into, and within, this District through an established distribution channel. These infringing products have been purchased by consumers and businesses in this District.

20. On information and belief, WD's executive vice president and general manager of its Hard-Disk Drive ("HDD") unit, Ashley Gorakhpurwalla, works in the Austin, Texas area.

21. On information and belief, WD technologist Mr. Cohen Steed works in the Austin, Texas area.

22. On information and belief, senior director and assistant general counsel of intellectual property and licensing at WD, Mr. Soji John, works in the Sunnyvale, Texas area.

IV. COUNTS OF PATENT INFRINGEMENT

23. Plaintiff alleges that Defendant has infringed the following United States patents (collectively, the "Asserted Patents"):

United States Patent No. RE38,806 (the "806 Patent") (Exhibit A)
United States Patent No. 6,352,879 (the "879 Patent") (Exhibit B)
United States Patent No. 6,181,002 (the "002 Patent") (Exhibit C)

COUNT ONE **INFRINGEMENT OF U.S. PATENT RE38,806**

24. Plaintiff incorporates by reference the allegations in all preceding paragraphs as if fully set forth herein.

25. The '806 Patent, entitled "SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME," was filed on May 02, 2003 and duly and legally issued by the United States Patent and Trademark Office on October 04, 2005. The '806 Patent is a reissue of U.S. Patent No. 6,229,217, which was filed on June 27, 2000 and issued on May 8, 2001.

26. The '806 Patent claims patent-eligible subject matter and is valid and enforceable.

Technical Description and Background

27. The '806 Patent is directed to a Chip Size Package ("CSP") structure, and a method of manufacturing such a semiconductor device. '806 Patent, 1:18-20. Transistors are semiconductor devices that are formed on wafers, which are made by foundries. Wafers contain multiple, essentially identical chips which are designed by chip designers. Individual chips are cut from wafers and packaged. Those chips go into a variety of consumer products, such as smartphones, tablets, personal computers, solid state drives (SSDs), memory cards, thumb drives, and automobile parts and components. In some devices such as portable devices, a plurality of semiconductor chips are mounted in a package so as to increase the added value and capacity of memory, etc. For example, a multi-chip module is provided with a plurality of semiconductor chips arranged parallel to each other in a package. However, such an arrangement makes it impossible to produce a package smaller than the total area of the semiconductor chips to be mounted. In order to solve the problem, a stacked package including a plurality of semiconductor chips laminated in a package to achieve a high packaging density was developed. '806 Patent, 1:53-63. Despite the relatively small size and high density of the stacked package semiconductor devices, semiconductor packages that are even smaller than such a stacked package semiconductor device were required. Hence, a semiconductor device

having a CSP structure as well as stacked package structure was needed. '806 Patent, 2:10-15.

28. Specifically, the '806 Patent provides a further-miniaturized semiconductor device having a stacked package structure as well as a CSP structure. '806 Patent, 2:63-65. In order to achieve such a miniaturized, high-density semiconductor device structure, the '806 Patent claims the first semiconductor chip and the second semiconductor chip are each wire-bonded to the electrode section provided on the wiring layer with the wires, and the second insulating adhesion layer is used for affixing the second semiconductor chip to the first semiconductor chip. This structure eliminates the need for wire-bonding the first and second semiconductor chips to points on the wiring layer, far from the side surfaces of the first and second semiconductor chips, considering a situation in which the excessively applied adhesive agent overflows the space between the first and second semiconductor chips. '806 Patent, 3:19-29. Moreover, in the case of using a thermo-compression sheet, accurate positioning is required twice when mounting the first or second semiconductor chip at a desired location, i.e., positioning the thermo-compression sheet and positioning the first or second semiconductor chip on the thermo-compression sheet. Whereas, because in the present invention the first and the second insulating adhesion layers are in advance disposed on the back surface of the first and the second semiconductor chips, the first and the second semiconductor chips can be mounted at a desired location by accurately positioning it only once.

Hence, the '806 Patent simplifies the manufacturing process of miniaturized semiconductors. '806 Patent, 3:33-44.

29. The '806 Patent introduces a manufacturing method in which the adhesive agent does not overflow in the space between the first and the second semiconductor chip, and the first and the second semiconductor chip can be wire-bonded to the wiring layer at a location closer to the edges of the first and the second semiconductor chips. It is thus possible to realize a miniaturized, high-density semiconductor device. '806 Patent, 4:57-63.

Direct Infringement

30. Defendant without authorization or license from Plaintiff, has directly infringed the '806 Patent, either literally or equivalently, as infringement is defined by 35 U.S.C. § 271, including through making, using (including for testing purposes), designing, manufacturing, importing, distributing, selling, and offering for sale electronic devices and products that infringe one or more claims of the '806 Patent. Defendant is thus liable for direct infringement pursuant to 35 U.S.C. § 271.

31. Exemplary infringing products include WD chip arrangements, flash memory, SSDs, and memory cards made by or incorporating WD's Sandisk products, such as its NAND flash memories or memory cards, including but not limited to the 48L 3D, 15 nm, 19 nm, and 24 nm node and similar WD products employing the '806 Patent. These infringing products include but are not limited to the Sandisk/Toshiba THGBX6T1T82LFXF256GB 48L 3D NAND, Sandisk SDSDQ-032G 15 nm 16 GB NAND flash memory, Sandisk/Toshiba TH58TEG7D2JBA4C 19nm NAND flash

memory, Sandisk/Toshiba 24 nm 64 GB NAND flash in SDSDQY-064G-A11A MicroSDXC Memory Cards, Sandisk SDMPEGF18-256G NAND flash memory, Sandisk SDINDDH4-128G NAND Embedded Flash Drive (EFD), Sandisk TP79G51ARA (found at least in Seagate Nytro 141 SSD), WD Ultrastar SS200 SSD, Sandisk 05565-1024G, WD SN750 SSD, Sandisk 05561-512G, Sandisk Extreme Pro SSD, Sandisk TP70G76AWV 3D NAND flash memory, Western Digital SDINEDK4-128G 3D NAND flash memory, Western Digital SDINEDK4-256G 3D NAND flash memory, Sandisk 05139-128G, Western Digital WDS500G2B0A SSD, Sandisk 05138-064G Ultra 3D SSD, Sandisk TP70G76AWV (found at least in Inland Professional 2TB SSD), Sandisk SDINBDA4-128G, Sandisk TP79G51ARA (found at least in Seagate Nytro 141 SSD), Sandisk 15139_064G, Sandisk SDMPEGF12_064G, Sandisk SDINBDG4-16G, and similar products, hereinafter “’806 Accused Products.”

32. Plaintiff names these exemplary infringing instrumentalities to serve as notice of Defendant’s infringing acts, but Plaintiff reserves the right to name additional infringing products, known to or learned by Plaintiff or revealed during discovery, and include them more specifically in the definition of ’806 Accused Products.

33. As a specific, nonlimiting example, Defendant is liable for direct infringement pursuant to 35 U.S.C. § 271 for the manufacture, sale, offer for sale, importation, or distribution of WD’s Sandisk/Toshiba TH58TEG7D2JBA4C 19nm NAND flash memory, hereinafter “’806 Exemplary Accused Product.” The ’806

Exemplary Accused Product meets all limitations of at least claim 1 of the '806 Patent, either literally or under the doctrine of equivalents.

34. The '806 Exemplary Accused Product is semiconductor device including a stacked package structure and a chip size package structure, comprising: an insulating substrate (A) including a wiring layer (B) having electrode sections (C):

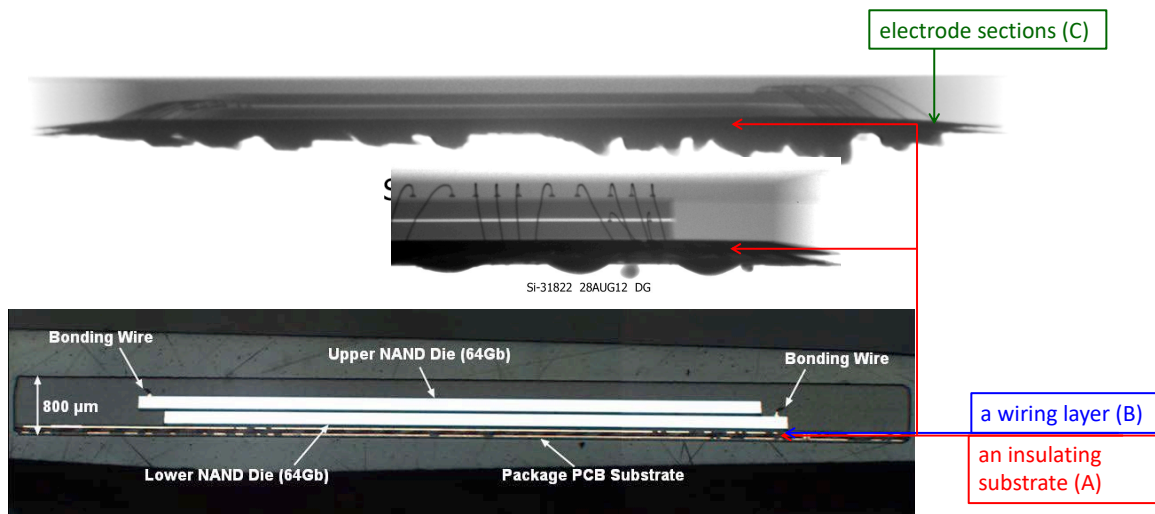


Fig 1: Package X-ray image (upper) and Cross-Sectional Optical Image of the Package

35. The '806 Exemplary Accused Product further comprises a first semiconductor chip (D) having a first adhesion layer (E) adhered to its back surface (F) where a circuit is not formed (G), said first semiconductor chip being mounted on said wiring layer through the first adhesion layer (H):

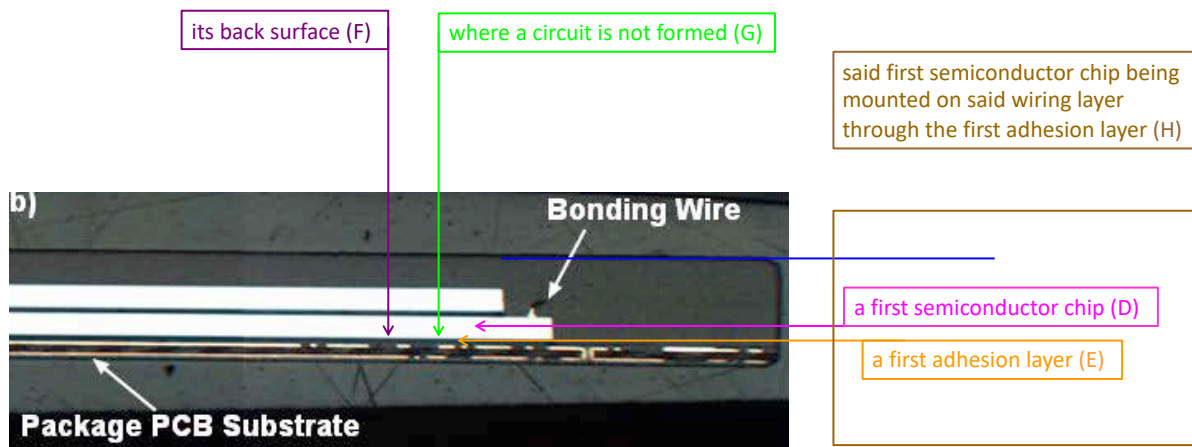


Fig 2: Cross-Sectional Optical Image of the Package

36. The '806 Exemplary Accused Product further comprises a second semiconductor chip (I) having a second adhesion layer (J) adhered to its back surface (K) where a circuit is not formed (L), said second semiconductor chip being mounted on a circuit-formed front surface of said first semiconductor chip through the second adhesion layer (M):

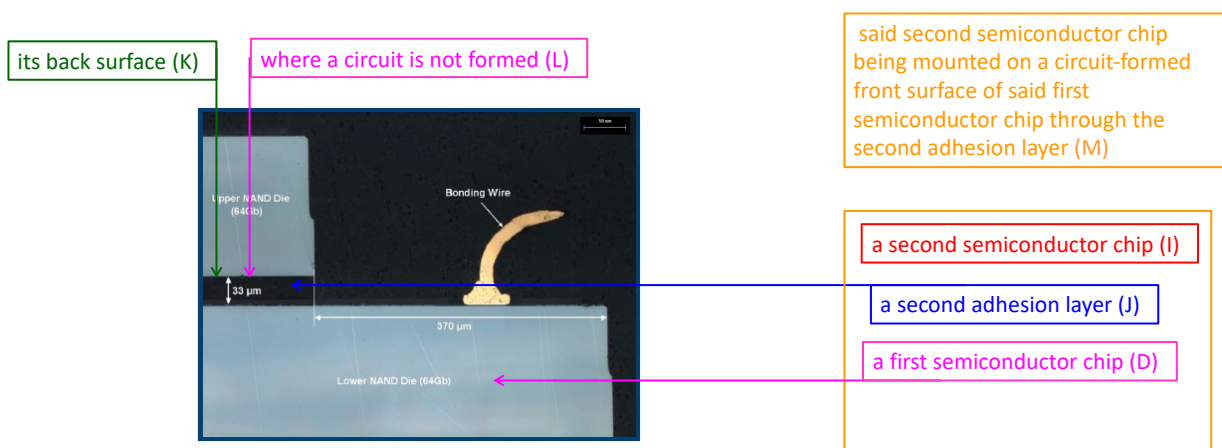


Fig 3: Cross-Sectional Optical Image of the Package

37. In the '806 Exemplary Accused Product, each of said first and second semiconductor chips being wire-bonded to the electrode section with a wire (N), said first and second semiconductor chips and the wire being sealed with a resin (O):

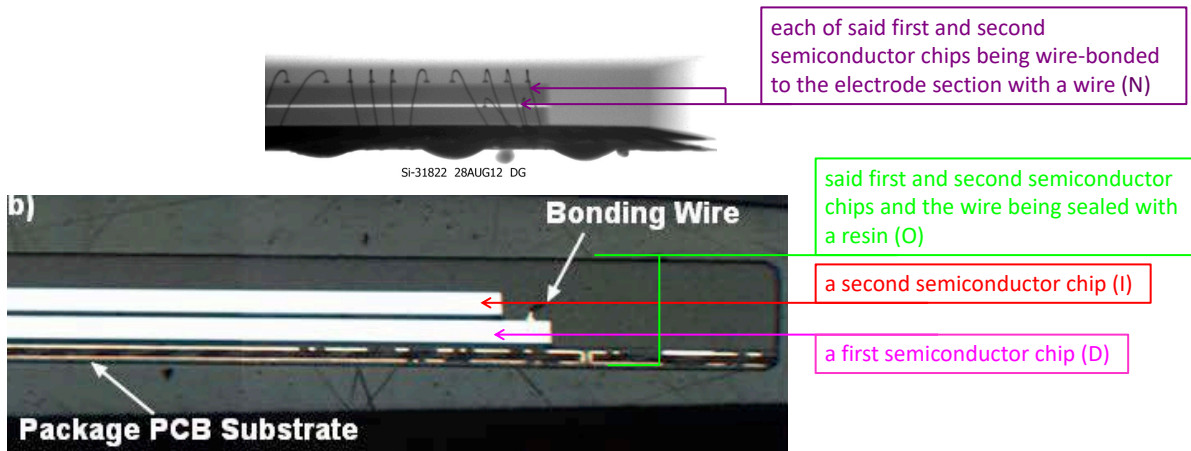


Fig 4: Package X-ray image (upper) and Cross-Sectional Optical Image of the Package

Willful Infringement

38. Defendant had actual knowledge of the '806 Patent and its infringement thereof at least as of receipt of Plaintiff's notice letter dated September 7, 2018.

39. Defendant has numerous lawyers and other active agents of Defendant who regularly review patents and published patent applications relevant to technology in the fields of the Asserted Patents.

40. Defendant has been issued over 13,000 patents held in the name of the Defendant or a related entity, many of which are patents prosecuted in the USPTO in the same technology area as the '806 Patent, giving Defendant intimate knowledge of the art in fields relevant to this civil action. The timing, circumstances and extent

of Defendant obtaining actual knowledge of the '806 Patent prior to the commencement of this lawsuit will be confirmed during discovery.

41. Defendant's infringement of the Asserted Patents was either known or was so obvious that it should have been known to Defendant.

42. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard infringed the '806 Patent. Defendant continued to commit acts of infringement despite being on notice of infringement and aware of an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights, either literally or equivalently.

43. Defendant is therefore liable for willful infringement, and Plaintiff accordingly seeks enhanced damages pursuant to 35 U.S.C. §§ 284 and 285.

Indirect, Induced, and Contributory Infringement

44. Defendant, directly and/or through its subsidiaries, affiliates, agents, and/or business partners, has committed acts of indirect infringement of at least one claim of the '806 Patent, pursuant to 35 U.S.C. §§ 271(b) and (c) by actively inducing or contributing to the acts of direct infringement performed by others in the United States, the State of Texas, and the Western District of Texas.

45. Defendant has induced through affirmative acts its distributors, manufacturers, testers, customers, and/or end users, such as designers of Defendant's chips and end users of Defendant's chips, to directly infringe the '806 Patent by making, using, selling, and/or importing the Accused Products, with the specific

intent to induce acts constituting infringement, and knowing that the induced acts constitute patent infringement, either literally or equivalently.

46. Defendant has knowingly contributed to direct infringement by its customers through affirmative acts and by having imported, sold, and/or offered for sale, and knowingly importing, selling, and/or offering to sell within the United States the '806 Accused Products which are not suitable for substantial non-infringing use and which are especially made or especially adapted for use by its customers in an infringement of the asserted patent.

47. The affirmative acts of inducement by Defendant include, but are not limited to, any one or a combination of: (i) designing infringing chips for manufacture according to specification; (ii) collaborating on and/or funding the development of the infringing chips and/or technology; (iii) soliciting and sourcing the manufacture of infringing chips; (iv) licensing and transferring technology and know-how to enable the manufacture of infringing chips; (v) enabling and encouraging the use, sale, or importation of infringing chips by its customers; (vi) advertising the infringing chips and/or technology; and (vii) providing data sheets, technical guides, demonstrations, software and hardware specifications, installation guides, product specifications, user manuals, marketing materials, and instructions, including on Defendant's website.

48. Defendant has contributed to the direct infringement of the '806 Patent, its customers, and other third parties; and Defendant, its customers, and other third parties do directly infringe.

49. Defendant has imported, exported, made and/or sold parts, components, or intermediate products to customers and third parties that, once assembled, infringe the '806 Patent by the sale and/or use of the assembled memories and/or devices.

50. Defendant has made, used, sold, and/or offered to sell infringing devices and/or memory products, which are especially made to design and specification, and are not staple products or commodities with substantial non-infringing use.

51. Defendant knew that the induced conduct would constitute infringement and intended that infringement at the time of committing the aforementioned acts, such that the acts and conduct have been and continue to be committed with the specific intent to induce infringement, or deliberately avoiding learning of the infringing circumstances at the time of committing these acts so as to be willfully blind to the infringement that was induced.

52. As a result of Defendant's infringement, Plaintiff has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement which, by law, can be no less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

53. Plaintiff has incurred and will continue to incur substantial damages, including monetary damages.

54. Therefore, Plaintiff is entitled to actual and/or compensatory damages, reasonable royalties, pre-judgment and post-judgment interest, enhanced damages, and costs.

COUNT TWO
INFRINGEMENT OF U.S. PATENT 6,352,879

55. Plaintiff incorporates by reference the allegations in all preceding paragraphs as if fully set forth herein.

56. The '879 Patent, entitled "SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME," was filed on June 27, 2000 and duly and legally issued by the United States Patent and Trademark Office on March 5, 2002. The '879 Patent is a division of U.S. Patent No. 6,100,594, which was filed on December 30, 1998 and issued on August 8, 2000.

57. The '879 Patent claims patent-eligible subject matter and is valid and enforceable.

Technical Description and Background

58. The '879 Patent is directed to a Chip Size Package ("CSP") structure, and a method of manufacturing such a semiconductor device. '879 Patent, 1:13-15. Transistors are semiconductor devices that are formed on wafers, which are made by foundries. Wafers contain multiple, essentially identical chips which are designed by chip designers. Individual chips are cut from wafers and packaged. Those chips go into a variety of consumer products, such as smartphones, tablets, personal computers, solid state drives (SSDs), memory cards, thumb drives, and automobile parts and components. In some devices such as portable devices, a plurality of semiconductor chips are mounted in a package so as to increase the added value and capacity of memory, etc. For example, a multi-chip module is provided with a plurality of semiconductor chips arranged parallel to each other in a package.

However, such an arrangement makes it impossible to produce a package smaller than the total area of the semiconductor chips to be mounted. In order to solve the problem, a stacked package including a plurality of semiconductor chips laminated in a package to achieve a high packaging density was developed. '879 Patent, 1:49-59. Despite the relatively small size and high density of the stacked package semiconductor devices, semiconductor packages that are even smaller than such a stacked package semiconductor device were required. Hence, a semiconductor device having a CSP structure, as well as stacked package is required to be produced. '879 Patent, 2:6-11.

59. Specifically, the '879 Patent provides a further-miniaturized semiconductor device having a stacked package structure as well as a CSP structure. '879 Patent, 2:63-65. In order to achieve such a miniaturized, high-density semiconductor device structure, the '879 Patent claims the first semiconductor chip and the second semiconductor chip are each wire-bonded to the electrode section provided on the wiring layer with the wires, and the second insulating adhesion layer is used for affixing the second semiconductor chip to the first semiconductor chip. This structure eliminates the need for wire-bonding the first and second semiconductor chips to points on the wiring layer, far from the side surfaces of the first and second semiconductor chips, considering a situation in which the excessively applied adhesive agent overflows the space between the first and second semiconductor chips. '879 Patent, 3:14-24. Moreover, in the case of using a thermo-compression sheet, where twice accurate positioning is required when mounting the

first or second semiconductor chip at a desired location, i.e., positioning the thermo-compression sheet and positioning the first or second semiconductor chip on the thermo-compression sheet. Whereas, because in the present invention the first and the second insulating adhesion layers are in advance disposed on the back surface of the first and the second semiconductor chips, the first and the second semiconductor chips can be mounted at a desired location by accurately positioning it only once. Hence, the '879 Patent simplifies the manufacturing process of miniaturized semiconductors. '879 Patent, 3:27-39.

60. The '879 Patent introduces a manufacturing method in which the adhesive agent does not overflow in the space between the first and the second semiconductor chip, and the first and the second semiconductor chip can be wire-bonded to the wiring layer at a location closer to the edges of the first and the second semiconductor chip. It is thus possible to realize a miniaturized, high-density semiconductor device. '879 Patent, 4:54-60.

Direct Infringement

61. Defendant, without authorization or license from Plaintiff, has directly infringed the '879 Patent, either literally or equivalently, as infringement is defined by 35 U.S.C. § 271, including through making, using (including for testing purposes), designing, manufacturing, importing, distributing, selling, and offering for sale electronic devices and products that are made by a method that infringe one or more claims of the '879 Patent. Defendant has further provided services that practice

methods that infringe one or more claims of the '879 Patent. Defendant is thus liable for direct infringement pursuant to 35 U.S.C. § 271.

62. Exemplary infringing products include WD chip arrangements, flash memory, SSDs, and memory cards made by or incorporating WD's Sandisk products, such as its NAND flash memories or memory cards, including but not limited to the 48L 3D, 15 nm and 19 nm node and similar WD products employing the '879 Patent. These infringing products include but are not limited to the Sandisk/Toshiba THGBX6T1T82LFXF256GB 48L 3D NAND, Sandisk SDSDQ-032G 15 nm 16 GB NAND flash memory, Sandisk/Toshiba TH58TEG7D2JBA4C 19nm NAND flash memory, Sandisk SDMPEGF18-256G NAND flash memory, Sandisk SDINDDH4-128G NAND Embedded Flash Drive (EFD), Sandisk TP79G51ARA (found at least in Seagate Nytro 141 SSD), WD Ultrastar SS200 SSD, Sandisk 05565-1024G, WD SN750 SSD, Sandisk 05561-512G, Sandisk Extreme Pro SSD, Sandisk TP70G76AWV 3D NAND flash memory, Western Digital SDINEDK4-128G 3D NAND flash memory, Western Digital SDINEDK4-256G 3D NAND flash memory, Sandisk 05139-128G, Western Digital WDS500G2B0A SSD, Sandisk 05138-064G Ultra 3D SSD, Sandisk TP70G76AWV (found at least in Inland Professional 2TB SSD), Sandisk SDINBDA4-128G, Sandisk TP79G51ARA (found at least in Seagate Nytro 141 SSD), Sandisk 15139_064G, Sandisk SDMPEGF12_064G, Sandisk SDINBDG4-16G, and similar products, hereinafter "'879 Accused Products."

63. Plaintiff names these exemplary infringing instrumentalities to serve as notice of Defendant's infringing acts, but Plaintiff reserves the right to name

additional infringing products, known to or learned by Plaintiff or revealed during discovery, and include them more specifically in the definition of '879 Accused Products.

64. As a specific, nonlimiting example, Defendant is liable for direct infringement pursuant to 35 U.S.C. § 271 for the manufacture, sale, offer for sale, importation, or distribution of WD's Sandisk/Toshiba TH58TEG7D2JBA4C 19nm NAND flash memory, hereinafter "879 Exemplary Accused Product." The '879 Exemplary Accused Product is made by a method that meets all limitations of at least claim 1 of the '879 Patent, either literally or under the doctrine of equivalents.

65. The '879 Exemplary Accused Product is a manufactured semiconductor device comprising forming a first adhesion layer (A) on a back surface of a first wafer (B), no circuit being formed on the back surface of the first wafer (C):

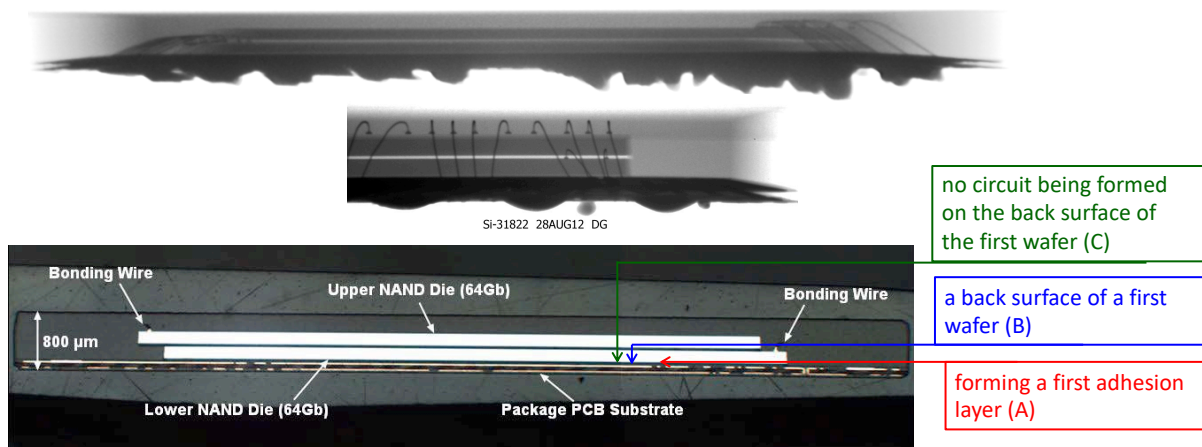


Fig 1: Package X-ray image (upper) and Cross-Sectional Optical Image(Lower) of the Package

66. The '879 Exemplary Accused Product is manufactured by producing separate first semiconductor chips from said first wafer by dicing (D):

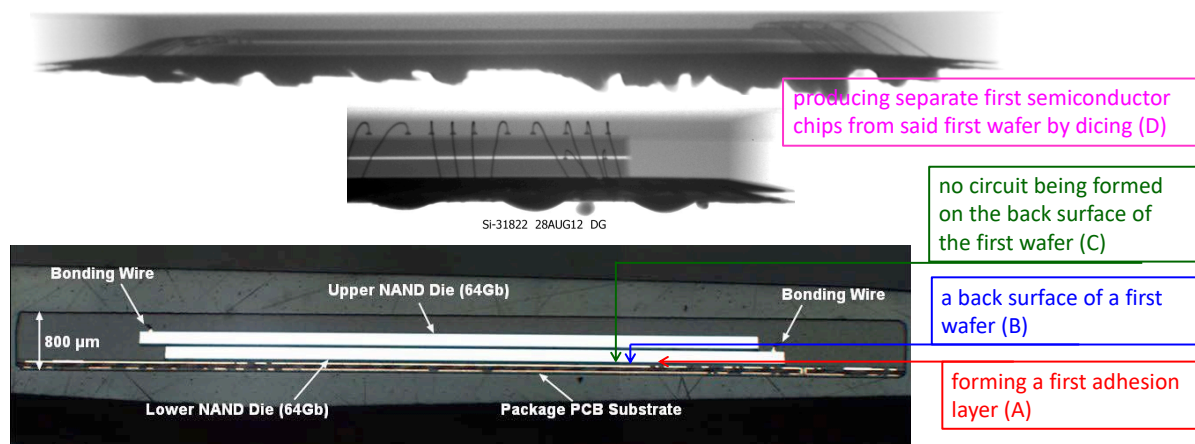


Fig 2: Package X-ray image (upper) and Cross-Sectional Optical Image(Lower) of the Package

67. The '879 Exemplary Accused Product is manufactured by mounting at least one of said first semiconductor chips on a wiring layer (E) with the back surface of the at least one first semiconductor chip facing said wiring layer (F):

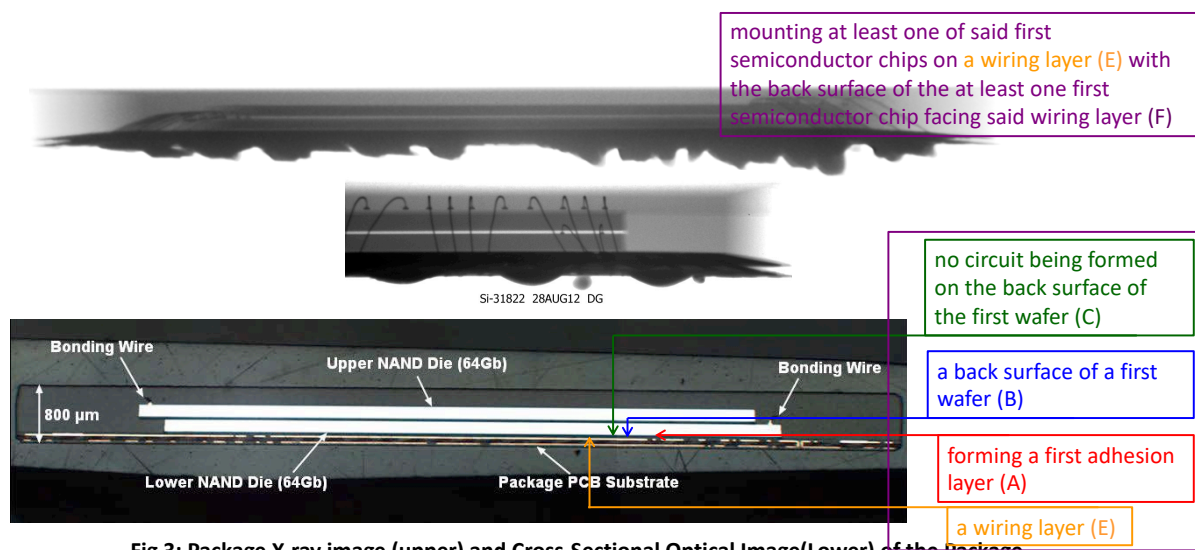


Fig 3: Package X-ray image (upper) and Cross-Sectional Optical Image(Lower) of the Package

68. The '879 Exemplary Accused Product is manufactured by forming a second adhesion layer (G) on a back surface of a second wafer (H), no circuit being formed on the back surface of the second wafer (I):

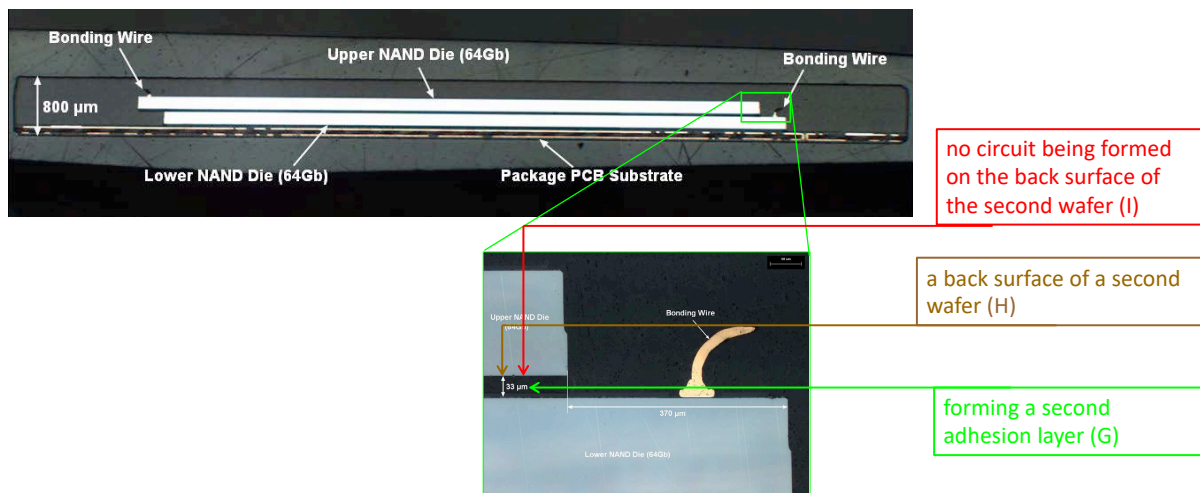


Fig 4: Cross-Sectional Optical Image of the Package

69. The '879 Exemplary Accused Product is manufactured by producing separate second semiconductor chips from said second wafer by dicing (J):

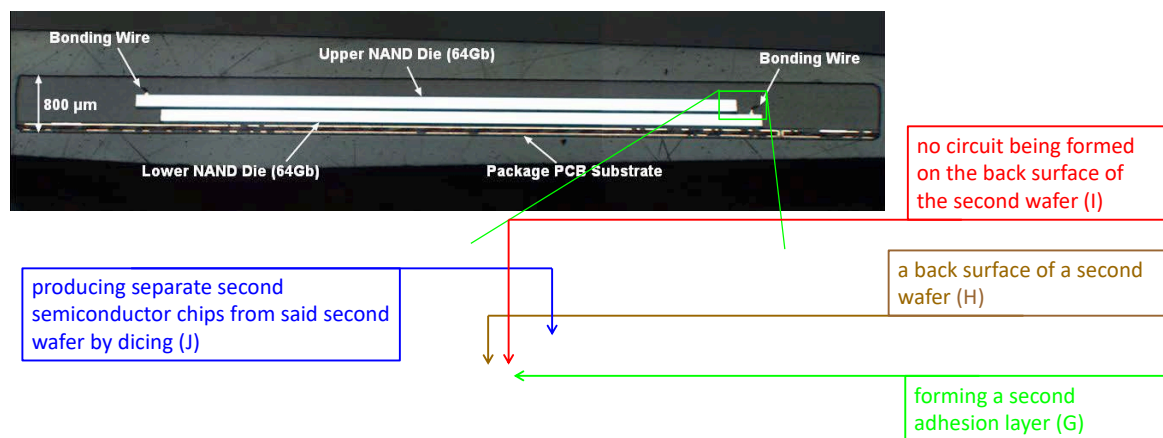


Fig 5: Cross-Sectional Optical Image of the Package

70. The '879 Exemplary Accused Product is manufactured by mounting said second semiconductor chip on said first semiconductor chip with its back surface facing said first semiconductor chip (K):

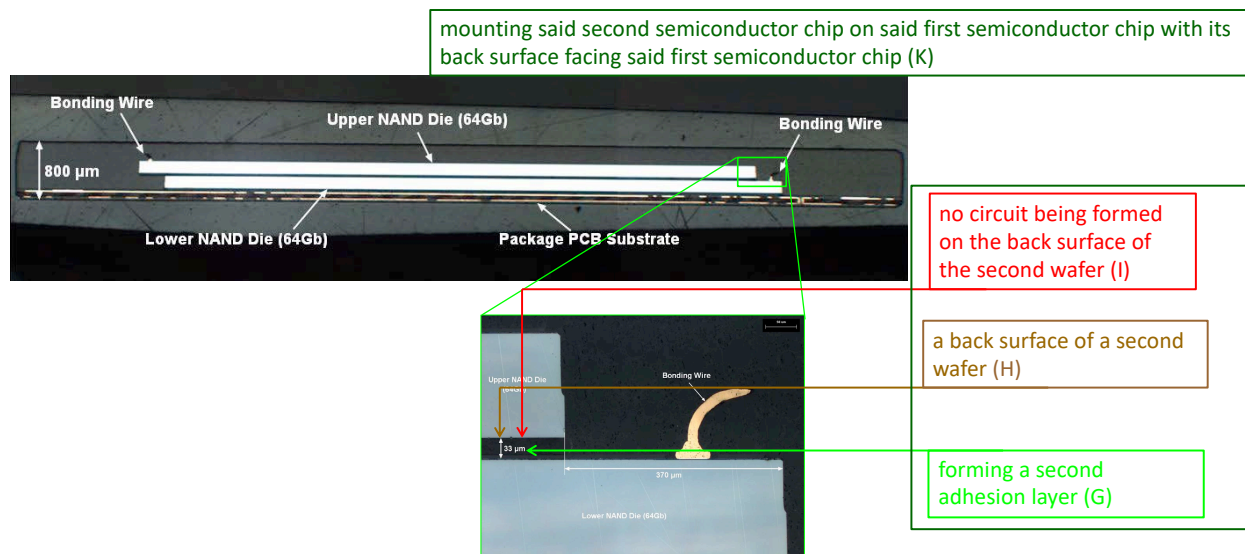


Fig 6: Cross-Sectional Optical Image of the Package

Willful Infringement

71. Defendant has had actual knowledge of the '879 Patent and its infringement thereof at least as of receipt of Plaintiff's notice letter dated September 7, 2018.

72. Defendant has numerous lawyers and other active agents who regularly review patents and published patent applications relevant to technology in the fields of the Asserted Patents.

73. Defendant has been issued over 13,000 patents held in the name of the Defendant or a related entity, many of which are patents prosecuted in the USPTO in the same technology area as the '879 Patent, giving Defendant intimate knowledge of the art in fields relevant to this civil action. The timing, circumstances and extent

of Defendant obtaining actual knowledge of the '879 Patent prior to the commencement of this lawsuit will be confirmed during discovery.

74. Defendant's infringement of the Asserted Patents was either known or was so obvious that it should have been known to Defendant.

75. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard infringed the '879 Patent. Defendant continued to commit acts of infringement despite being on notice of an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights, either literally or equivalently.

76. Defendant is therefore liable for willful infringement and Plaintiff accordingly seeks enhanced damages pursuant to 35 U.S.C. §§ 284 and 285.

Indirect, Induced, and Contributory Infringement

77. Defendant, directly and/or through its subsidiaries, affiliates, agents, and/or business partners, has committed acts of indirect infringement of at least one claim of the '879 Patent, pursuant to 35 U.S.C. §§ 271(b) and (c) by actively inducing or contributing to the acts of direct infringement performed by others in the United States, the State of Texas, and the Western District of Texas.

78. Defendant has induced through affirmative acts its distributors, manufacturers, testers, customers, and/or end users, such as designers of Defendant's chips and end users of Defendant's chips to directly infringe the '879 Patent by making, using, selling, and/or importing the Accused Products, with the specific

intent to induce acts constituting infringement, and knowing that the induced acts constitute patent infringement, either literally or equivalently.

79. Defendant has knowingly contributed to direct infringement by its customers through affirmative acts and by having imported, sold, and/or offered for sale, and knowingly importing, selling, and/or offering to sell within the United States the '879 Accused Products which are not suitable for substantial non-infringing use and which are especially made or especially adapted for use by its customers in an infringement of the asserted patent.

80. The affirmative acts of inducement by Defendant include, but are not limited to, any one or a combination of: (i) designing infringing chips for manufacture according to specification; (ii) collaborating on and/or funding the development of the infringing chips and/or technology; (iii) soliciting and sourcing the manufacture of infringing chips; (iv) licensing and transferring technology and know-how to enable the manufacture of infringing chips; (v) enabling and encouraging the use, sale, or importation of infringing chips by its customers; (vi) advertising the infringing chips and/or technology; and (vii) providing data sheets, technical guides, demonstrations, software and hardware specifications, installation guides, product specifications, user manuals, marketing materials, and instructions.

81. Defendant has contributed to the direct infringement of the '879 Patent by its customers, and other third parties; and Defendant, its customers, and other third parties have directly infringed.

82. Defendant has imported, exported, made and/or sold parts, components, or intermediate products to customers and third parties that, once assembled, infringe the '879 Patent by the sale and/or use of the assembled memories and/or devices.

83. Defendant makes, uses, sells, and/or offers to sell infringing semiconductor devices and/or memory products, which are especially made to design and specification, and are not staple products or commodities with substantial non-infringing use.

84. Defendant knew that the induced conduct would constitute infringement and intended that infringement at the time of committing the aforementioned acts, such that the acts and conduct have been committed with the specific intent to induce infringement, or deliberately avoiding learning of the infringing circumstances at the time of committing these acts so as to be willfully blind to the infringement that was induced.

85. As a result of Defendant's infringement, Plaintiff has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement which, by law, can be no less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

86. Plaintiff has incurred and will continue to incur substantial damages, including monetary damages.

87. Therefore, Plaintiff is entitled to actual and/or compensatory damages, reasonable royalties, pre-judgment and post-judgment interest, enhanced damages, and costs.

COUNT THREE
INFRINGEMENT OF U.S. PATENT 6,181,002

88. Plaintiff incorporates by reference the allegations in all preceding paragraphs as if fully set forth herein.

89. The '002 Patent, entitled "SEMICONDUCTOR DEVICE HAVING A PLURALITY OF SEMICONDUCTOR CHIPS," was filed on December 13, 1999 and duly and legally issued by the United States Patent and Trademark Office on January 30, 2001.

90. The '002 Patent claims patent-eligible subject matter and is valid and enforceable.

Technical Description and Background

91. The '002 Patent is directed to a resin over-molded type of semiconductor device having a plurality of semiconductor chips arranged in a stacked relation for higher density integration. '002 Patent, 1:15-18. According to the '002 Patent, multiple-chip arrangements and techniques are utilized to enhance capacities and otherwise improve memories for portable systems, and semiconductor devices have been provided which include a plurality of semiconductor chips mounted in a single package. '002 Patent, 1:20-23. The '002 Patent enumerates some of these multiple-chip arrangements for semiconductor devices, such as: juxtaposition, stacked package, chip size package ("CSP"), ball grid array ("BGA"), and land grid array

(“LGA”). ’002 Patent, 1:23-63. Temperature change in the aforementioned arrangements for semiconductor devices, where only one side of the chip is sealed with a mold resin, causes stress between the semiconductor device and the printed board due to a difference in the coefficient of expansion and a bimetal phenomenon between the chip and the mold resin portion, resulting in cracking and breakage of the junctures. ’002 Patent, 1:64-2:12.

92. These problems are addressed in the ’002 Patent. The ’002 Patent notes “a semiconductor device which comprises: an insulative substrate having a layer of interconnection patterns formed on a chip-side surface thereof, and external terminals formed on a surface thereof opposite from the chip-side surface; and a plurality of semiconductor chips stacked on the chip-side surface of the insulative substrate and electrically connected to the corresponding interconnection patterns; wherein, among the plurality of semiconductor chips, a semiconductor chip having the largest plan surface area has the greatest thickness.” ’002 Patent, 2:17-26.

93. The ’002 Patent addresses the problems identified in existing semiconductor chip arrangements by, among other steps, adding “another layer of interconnection pattern . . . on the surface of the insulative substrate opposite from the chip-side surface.” ’002 Patent, 2:27-29.

Direct Infringement

94. Defendant, without authorization or license from Plaintiff, has directly infringed the ’002 Patent, either literally or equivalently, as infringement is defined by 35 U.S.C. § 271, including through making, using (including for testing purposes),

designing, manufacturing, importing, distributing, selling, and offering for sale memories and other electronic hardware, devices, and products that are made by a method that infringes one or more claims of the '002 Patent. Defendant has further provided services that practice methods that infringe one or more claims of the '002 Patent. Defendant is thus liable for direct infringement pursuant to 35 U.S.C. § 271.

95. Exemplary infringing products include WD's Sandisk/Toshiba THGBX6T1T82LFXF256GB 48L 3D NAND flash memory, Sandisk SDMPEGF18-256G NAND flash memory, Sandisk SDMPEGF12_064G, as well as similar WD products employing the '002 Patent, as well as consumer products that incorporate the infringing WD memories, including but not limited to smartphones, computers, laptops, and other electronic devices, hereinafter "'002 Accused Products."

96. Plaintiff names this exemplary infringing instrumentality to serve as notice of Defendant's infringing acts, but Plaintiff reserves the right to name additional infringing products, known to or learned by Plaintiff or revealed during discovery, and include them more specifically in the definition of '002 Accused Products.

97. As a specific, nonlimiting example, Defendant is liable for direct infringement pursuant to 35 U.S.C. § 271 for the manufacture, sale, offer for sale, importation, or distribution of WD's Sandisk/Toshiba THGBX6T1T82LFXF256GB 48L 3D NAND flash memory, hereinafter "'002 Exemplary Accused Product." The '002 Exemplary Accused Product meets all limitations of at least claim 1 of the '002 Patent, either literally or under the doctrine of equivalents.

98. The '002 Exemplary Accused Product is a semiconductor device which comprises an insulative substrate (A) having a layer of interconnection patterns (B) formed on a chip-side surface (C) thereof and external terminals (D) formed on a surface thereof opposite from the chip-side surface (E):

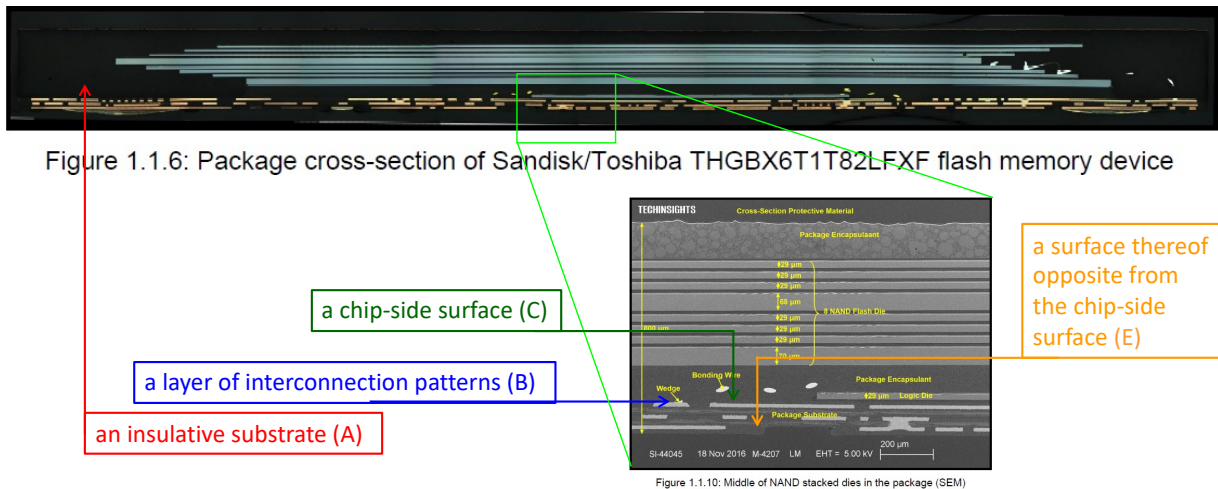


Fig 1: Cross-Sectional Optical (the upper) and SEM (the lower) Image of the Package

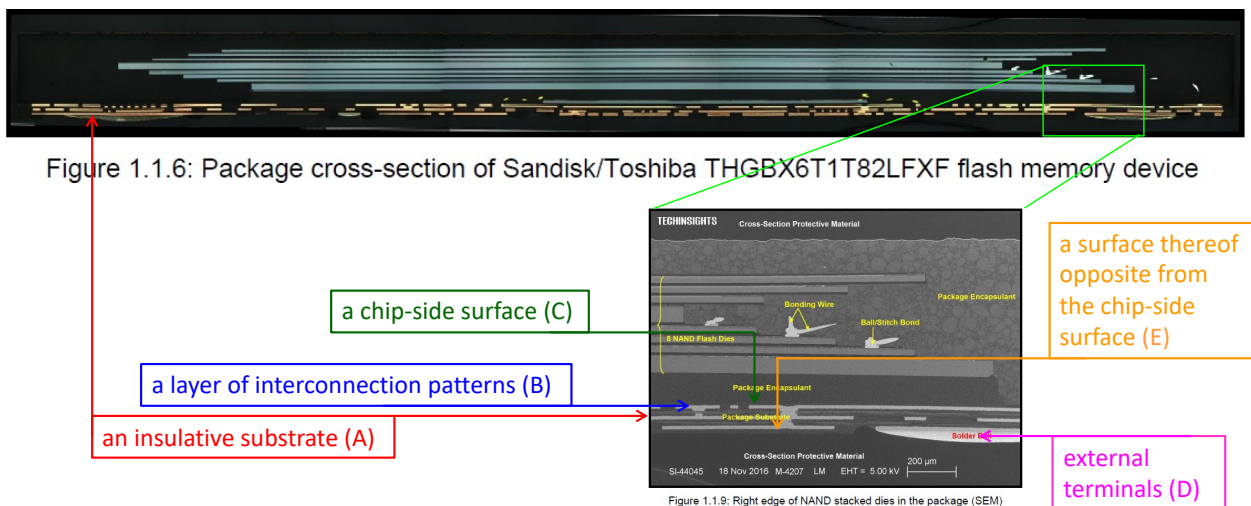


Fig 2: Cross-Sectional Optical (the upper) and SEM (the lower) Image of the Package

99. The '002 Exemplary Accused Product is a semiconductor device which comprises a plurality of semiconductor chips (F) stacked on the chip-side surface of the insulative substrate and each electrically connected to corresponding interconnection patterns (G):

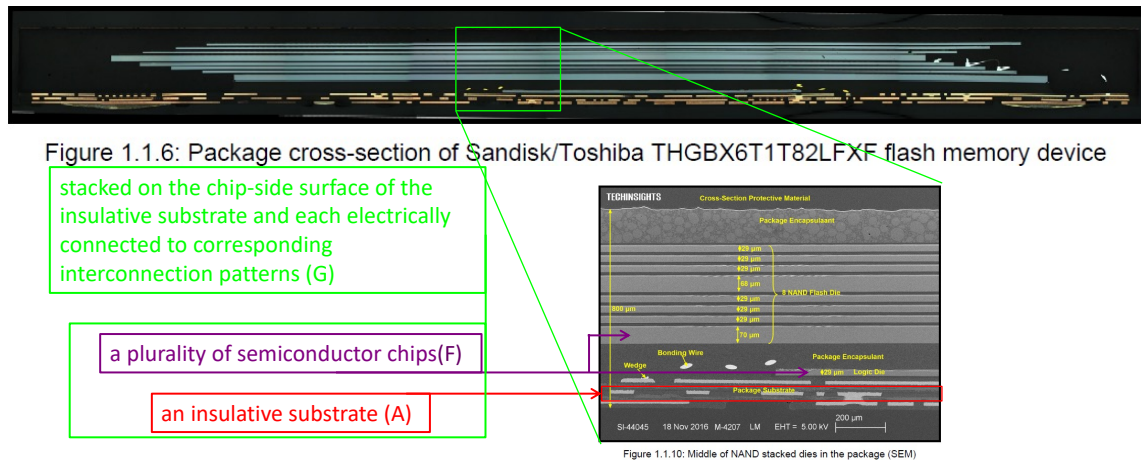


Fig 3: Cross-Sectional Optical (the upper) and SEM (the lower) Image of the Package

100. In the '002 Exemplary Accused Product, among the plurality of semiconductor chips, a semiconductor chip having the largest plan surface area has the greatest thickness (H):

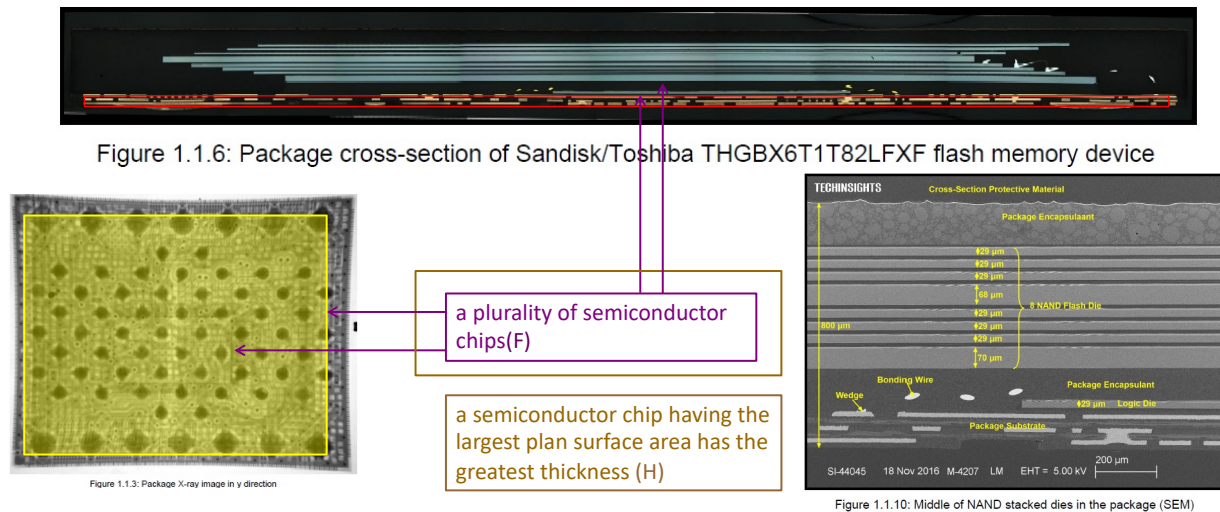


Fig 4: Cross-Sectional Optical (the upper) and Planview (the lower) Image of the Package

Willful Infringement

101. Defendant has had actual knowledge of the '002 Patent and its infringement thereof at least as of receipt of Plaintiff's notice letter dated September 7, 2018.

102. Defendant has numerous lawyers and other active agents who regularly review patents and published patent applications relevant to technology in the fields of the Asserted Patents.

103. Defendant has been issued over 13,000 patents held in the name of the Defendant or a related entity, many of which are patents prosecuted in the USPTO in the same technology area as the '002 Patent, giving Defendant intimate knowledge of the art in fields relevant to this civil action. The timing, circumstances and extent of Defendant obtaining actual knowledge of the '002 Patent prior to the commencement of this lawsuit will be confirmed during discovery.

104. Defendant's infringement of the Asserted Patents was either known or was so obvious that it should have been known to Defendant.

105. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard infringed the '002 Patent. Defendant continued to commit acts of infringement despite being on notice of an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights, either literally or equivalently.

106. Defendant is therefore liable for willful infringement and Plaintiff accordingly seeks enhanced damages pursuant to 35 U.S.C. §§ 284 and 285.

Indirect, Induced, and Contributory Infringement

107. Defendant, directly and/or through its subsidiaries, affiliates, agents, and/or business partners, has committed acts of indirect infringement of at least one claim of the '002 Patent, pursuant to 35 U.S.C. §§ 271(b) and (c), by actively inducing or contributing to the acts of direct infringement performed by others in the United States, the State of Texas, and the Western District of Texas.

108. Defendant has induced through affirmative acts its distributors, manufacturers, testers, customers, and/or end users, such as designers of Defendant's chips and end users of Defendant's chips to directly infringe the '002 Patent by making, using, selling, and/or importing the Accused Products, with the specific intent to induce acts constituting infringement, and knowing that the induced acts constitute patent infringement, either literally or equivalently.

109. Defendant has knowingly contributed to direct infringement by its customers through affirmative acts and by having imported, sold, and/or offered for sale, and knowingly importing, selling, and/or offering to sell within the United States the '002 Accused Products which are not suitable for substantial non-infringing use and which are especially made or especially adapted for use by its customers in an infringement of the asserted patent.

110. The affirmative acts of inducement by Defendant have included, but are not limited to, any one or a combination of: (i) designing infringing chips for manufacture according to specification; (ii) collaborating on and/or funding the development of the infringing chips and/or technology; (iii) soliciting and sourcing the manufacture of infringing chips; (iv) licensing and transferring technology and know-how to enable the manufacture of infringing chips; (v) enabling and encouraging the use, sale, or importation of infringing chips; enabling and encouraging the use, sale, or importation of infringing chip by its customers; (vi) advertising the infringing chips and/or technology; and (vii) providing data sheets, technical guides, demonstrations, software and hardware specifications, installation guides, product specifications, user manuals, marketing materials, and instructions.

111. Defendant has contributed to the direct infringement of the '002 Patent by its customers and other third parties; and Defendant, its customers, and other third parties have directly infringed.

112. Defendant has imported, exported, made and/or sold parts, components, or intermediate products to customers and third parties that, once assembled,

infringe the '002 Patent by the sale and/or use of the assembled memories and/or devices.

113. Defendant has made, used, sold, and/or offered to sell infringing semiconductor devices and/or memory products, which are especially made to design and specification, and are not staple products or commodities with substantial non-infringing use.

114. Defendant knew that the induced conduct would constitute infringement and intended that infringement at the time of committing the aforementioned acts, such that the acts and conduct have been committed with the specific intent to induce infringement, or deliberately avoiding learning of the infringing circumstances at the time of committing these acts so as to be willfully blind to the infringement that was induced.

115. As a result of Defendant's infringement, Plaintiff has suffered monetary damages and is entitled to an award of damages adequate to compensate it for such infringement which, by law, can be no less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

116. Plaintiff has incurred and will continue to incur substantial damages, including monetary damages.

117. Therefore, Plaintiff is entitled to actual and/or compensatory damages, reasonable royalties, pre-judgment and post-judgment interest, enhanced damages, and costs.

V. NOTICE

118. Katana has complied with the notice requirement of 35 U.S.C. § 287 and has not distributed, sold, offered for sale, or made products embodying the Asserted Patents. This notice requirement has been complied with by all relevant persons at all relevant times.

119. Defendant has had actual knowledge of the Asserted Patents and their infringement thereof at least as of receipt of Plaintiff's notice letter dated September 7, 2018.

VI. JURY DEMAND

120. Plaintiff Katana demands a trial by jury of all matters to which it is entitled to trial by jury, pursuant to FED. R. CIV. P. 38.

VII. PRAYER FOR RELIEF

WHEREFORE, Plaintiff Katana prays for judgment and seeks relief against Defendant as follows:

- A. That the Court determine that one or more claims of the '806 Patent has been infringed by the Defendant, literally and/or under the doctrine of equivalents;
- B. That the Court determine that one or more claims of the '879 Patent has been infringed by the Defendant, literally and/or under the doctrine of equivalents;
- C. That the Court determine that one or more claims of the '002 Patent has been infringed by the Defendant, literally and/or under the doctrine of equivalents;
- D. That the Court determine that one or more claims of the '806 Patent has been indirectly infringed by the Defendant;
- E. That the Court determine that one or more claims of the '879 Patent has been indirectly infringed by the Defendant;

- F. That the Court determine that one or more claims of the '002 Patent has been indirectly infringed by the Defendant;
- G. That the Court award damages adequate to compensate Plaintiff for the patent infringement that has occurred, together with prejudgment and post-judgment interest and costs;
- H. That the Court find this case to be exceptional pursuant to 35 U.S.C. § 285;
- I. That the Court determined that Defendant's infringements were willful;
- J. That the Court award enhanced damages against Defendant pursuant to 35 U.S.C. § 284;
- K. That the Court award reasonable attorneys' fees; and
- L. That the Court award such other relief to Plaintiff as the Court deems just and proper.

VIII. RESERVATION OF RIGHTS

Plaintiff's investigation is ongoing, and certain material information remains in the sole possession of Defendant or third parties, which will be obtained via discovery herein. Plaintiff expressly reserves the right to amend or supplement the causes of action set forth herein in accordance with FED. R. CIV. P. 15.

Dated: April 19, 2021

Respectfully Submitted,

/s/ Scott W. Breedlove

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